

REMARKS

The Applicants and the undersigned thank Examiner Connelly Cushwa for a careful review of this application.

Upon entry of this Amendment, Claims 1-24 are pending in the present application, with Claims 1, 8, and 17 being the independent claims that have not been withdrawn. The Examiner has rejected Claims 1-20. Claims 21-24 are withdrawn from consideration following an Election of Species Requirement. The Applicants have amended Claims 1-15 and 17-20 without adding new matter.

Independent Claim 1 is Patentable over the Cited References

The Examiner rejected independent Claim 1 under 35 U.S.C. 102(b) § based on an assertion that Canadian Published Patent Application Number 2,107,922 to Liao et al. (hereinafter “*Liao*”) anticipates that claim. The Examiner further asserted that, under 35 U.S.C. § 103(a), the English abstract of Japanese Patent Application Number JP 10-020123 to Chiba et al. (hereinafter “*Chiba*”) renders Claim 1 unpatentable in view of: *Liao*; the English abstract of Japanese Patent Application Publication Number JP 11-305052 to Akikuni et al. (hereinafter “*Akikuni*”); and the English abstract of Japanese Patent Application Publication Number JP 07-020327 to Sakai et al. (hereinafter “*Sakai*”). Applicants offer the following remarks to traverse the pending rejection.

Applicants respectfully submit that the references that the Examiner cited neither anticipate nor render obvious amended Claim 1 because the claim recites a combination of features the cited references do not disclose, teach, or suggest.

The cited references fail to describe, teach, disclose, or suggest a method for managing back reflections from a first end of an optical waveguide of an optical system, comprising the steps of: (1) coiling the first end of the optical waveguide around a coiling device; and (2) holding the coiled first end of the optical waveguide around the coiling device with a restraining device, wherein: (a) the coiled first end is operable to suppress the back reflections in response to transmitting light through the coiled first end, (b) a second end of the optical waveguide is attached to a first optical communication device, and (c) the restraining device is

operable to release the coiled first end of the optical waveguide for uncoiling to provide a communication link to a second optical communication device via the uncoiled first end, as recited in amended independent Claim 1.

As discussed on further detail below, Applicants respectfully submit that amended Claim 1 is allowable over *Liao*, *Chiba*, *Akikuni*, and *Sakai*. Those references, taken individually or in combination, do not teach, suggest, or disclose holding a coiled first end of an optical waveguide around a coiling device with a restraining device, operable to release the coiled first end of the optical waveguide for uncoiling to provide a communication link to a second optical communication device via the uncoiled first end, in accordance with the recitations of amended Claim 1.

Liao does not teach or disclose holding a coiled first end of an optical waveguide around a coiling device with a restraining device operable to release the coiled first end. Furthermore, *Liao* does not teach or disclose providing an optical communication link to a second optical communication device via the uncoiled first end.

The disclosure and teachings of *Liao* contrast with holding a coiled first end of an optical waveguide around a coiling device with a restraining device, operable to release the coiled first end of the optical waveguide for uncoiling as recited by amended Claim 1. In such contrast, *Liao* discloses and teaches a system comprising a small shaft that provides an adjustable level of reflection linked via synchronous gears to a large shaft “mainly used to collect and send the fiber optics” (emphasis added), apparently taking up optical fiber as it is wound and unwound from the small shaft, wherein one end of the fiber (element C) remains attached to the small shaft (element 20) and the other end, at the fiber optic coupler (element 25), “is secured on the case.” See *Liao* page 6, lines 2-24 and Figures 2A-2C.

Furthermore, in contrast to uncoiling to provide a communication link to an optical communication device via the uncoiled first end as recited by amended Claim 1, *Liao* discloses and teaches loops of fiber that provide adjustable reflection for instrumentation applications. See *Liao*, page 1, lines 4-9 and Figure 2B.

Chiba also does not teach or disclose holding a coiled first end of an optical waveguide around a coiling device with a restraining device, operable to release the coiled first end of the optical waveguide for uncoiling to provide a communication link to a second optical communication device via the uncoiled first end as required by the invention of amended

Claim 1. Further, Applicants submit that *Chiba* neither teaches nor discloses a coiled first end of an optical waveguide operable to suppress back reflections in accordance with the recitations of amended Claim 1. In contrast to the recitations of Claim 1, *Chiba* discloses winding an optical fiber around a core to provide light attenuation. See *Chiba*.

Sakai also does not teach or disclose holding a coiled first end of an optical waveguide around a coiling device with a restraining device, operable to release the coiled first end of the optical waveguide for uncoiling to provide a communication link to a second optical communication device via the uncoiled first end in accordance with the invention of Claim, 1 as amended. In contrast to the invention of Claim 1, *Sakai* discloses a non-reflective fiber optic termination for an optical fiber wherein “only the optical fiber 1 is used as components to be used;” apparently, optical fiber is the only component of *Sakai*’s termination. See *Sakai*, Constitution.

Akikuni also fails to teach or disclose holding a coiled first end of an optical waveguide around a coiling device with a restraining device, operable to release the coiled first end of the optical waveguide for uncoiling to provide a communication link to a second optical communication device via the uncoiled first end as required by amended Claim 1. Applicants further submit that *Akikuni* fails to teach or disclose coiling an optical waveguide around a coiling device in accordance with the requirements of the invention of amended Claim 1. In contrast to the invention of amended Claim 1, *Akikuni* discloses and teaches making a non-reflecting terminating device by threading an optical fiber through a pipe and deforming the pipe into a cork screw form, thereby “fixing [the fiber] into a prescribed shape and holding the optical fiber in a bend state by the bending of the pipe.” (Emphasis added). See *Akikuni*, Problem to be Solved.

In view of the foregoing discussion of differences between amended Claim 1 and *Liao*, *Chiba*, *Sakai*, and *Akikuni*, Applicants respectfully submit that those cited references, both individually and considered in combination, fail to disclose, teach, or suggest, the invention of amended Claim 1. Furthermore, Applicants submit that those cited references do not disclose or suggest integrating the features that amended Claim 1 recites into the present invention. Accordingly, Applicants respectfully request that the Examiner withdraw the pending rejection of Claim 1 and all claims dependent thereon.

Independent Claim 8 is Patentable over the Cited References

The Examiner rejected independent Claim 8 under 35 U.S.C. § 102(b) based on an assertion that *Liao* anticipates that claim. Applicants offer the following remarks to traverse the pending rejection.

Applicants respectfully submit that *Liao* does not anticipate amended Claim 8, because the claim recites a combination of features that *Liao* does not disclose, teach, or suggest. *Liao* fails to describe, teach, or suggest an optical system comprising an optical waveguide and a radius controlling device having a release, the optical waveguide comprising: (1) a cylindrical core having a first refractive index, the core comprising a light conducting material operative to guide light; (2) a cladding axially surrounding the core and operative to guide light, the cladding having a second refractive index lower than the first refractive index; (3) a first end; (4) a second end opposite the first end, the second end comprising an end face operative to reflect light back into the cylindrical core; and (5) a coil between the first end and the second end operative to suppress reflection from the end face, wherein the release is operable to: (a) restrain the coil around the radius controlling device with a controlled radius operative to attenuate guided light while controlling mechanical stresses of the optical waveguide; and (b) release the coil from around the radius controlling device to extend the optical waveguide to provide optical communication service over the optical waveguide, in accordance with the recitations of independent Claim 8, as amended.

As a first distinguishing feature between the invention of amended Claim 8 and *Liao*, the invention requires a radius controlling device having a release operable to: restrain the coil around the radius controlling device; and release the coil from around the radius controlling device to extend the optical waveguide to provide optical communication service. *Liao* does not disclose, teach, or suggest a radius controlling device having a release operable to release a coil to extend an optical waveguide to provide optical communication service in accordance with the recitations of amended Claim 8. In contrast to a release that releases a coil to extend an optical waveguide, *Liao* discloses winding a fiber around a large shaft and a small shaft, linked together via synchronous gears, without disclosing, teaching, or suggesting releasing the fiber from either shaft. In the mechanized system of *Liao*, “[t]he large shaft is mainly used to collect and send the fiber optics,” apparently taking up optical fiber as it is wound and unwound from the small shaft,

wherein one end C of the fiber remains attached to the small shaft 20 and the other end, at the fiber optic coupler 25, “is secured on the case.” See *Liao* page 6, lines 2-24 and Figures 2A-2C.

As a second distinguishing feature between amended Claim 8 and *Liao*, the claim recites a controlled radius operative to attenuate light guided while controlling mechanical stresses of the optical waveguide. Applicants submit that *Liao* does not disclose, teach, or suggest controlling mechanical stresses of an optical waveguide in accordance with the recitations of Claim 8 as amended. In contrast to controlling mechanical stresses of an optical waveguide, *Liao* discloses and teaches that the diameter of the small shaft relates to the resolution of reflection adjustment and that the diameter of the large shaft should be sufficiently large to avoid inducing optical bending loss. See *Liao* page 5, lines 17-21 and page 6, lines 4-9.

As a third distinguishing feature between amended Claim 8 and *Liao*, that claim recites providing optical communication service over a waveguide. As discussed above with reference to Claim 1, *Liao* teaches and discloses adjusting a reflection level for instrumentation, testing, and sensing applications, not providing optical communication service in accordance with the recitations of Claim 8. See *Liao*, page 1, lines 4-9.

In view of the foregoing discussion of *Liao* as compared to the recitations of amended Claim 8, Applicants respectfully submit that *Liao* does not disclose, teach, or suggest the invention of that claim. Accordingly, Applicants respectfully request that the Examiner withdraw the pending rejection of Claim 8 and all claims dependent thereon.

Independent Claim 17 is Patentable over the Cited References

The Examiner rejected independent Claim 17 under 35 U.S.C. § 102(b) based on an assertion that *Liao* anticipates that claim. Applicants submit the following remarks to traverse the pending rejection.

Liao fails to disclose, teach, or suggest an optical system comprising: (1) a spool having a radius; (2) an optical fiber having a source end attached to an optical communication source, an end face opposite the source end, and a section adjacent the end face; and (3) a restraint operative to: (a) hold the section in a coiled state around the spool to suppress reflections from the end face; and (b) release the section from the coiled state around the spool to provide communication service to a site by coupling the released optical fiber to an optical device at the site, as recited in independent Claim 17, as amended. Applicants respectfully submit that *Liao* does not anticipate

Claim 17 because the claim recites a combination of features that *Liao* does not disclose, teach, or suggest.

Liao does not disclose or teach providing optical communication service to a site by coupling a released optical fiber to an optical device at the site as required by amended Claim 17. In contrast to providing optical communication service, *Liao* teaches providing an adjustable level of reflection for instrumentation, testing, and sensing application. See *Liao*, page 1, lines 5-9. In contrast to a released optical fiber, *Liao*, as discussed above in reference to Claim 1, discloses and teaches having a first end and a second end of a fiber attached respectively to a small shaft and to a case. In the system of *Liao*, a “large shaft is mainly used to collect and send the fiber optic[]” as the fiber winds and unwinds from a small shaft that provides an adjustable level of reflection. See *Liao*, page 6, lines 2-24 and Figures 2A-2C.

In view of the above discussion regarding the distinctions between amended Claim 17 and *Liao*, Applicants submit that *Liao* does not disclose, teach, or suggest the invention of Claim 17 and respectfully request withdrawal of the pending rejection of Claim 17 and its dependent claims.

Dependent Claims 2-7, 9-16, and 18-20 are Patentable over the Cited References

Claims 2-7, Claims 9-16, and Claims 18-20 respectively depend from independent Claim 1, Claim 8, and Claim 17 and thereby incorporate the respective limitations of those independent claims. Those dependent claims, of which Claims 2-7, 9-15, and 18-20 are amended, also recite features further defining the present invention over the cited art. Accordingly, Applicants request separate and individual consideration of each dependent claim.

Dependent Claims 3, 6, 7, 11, and 13 comprise recitations, such as a number of loops and a radius selected according to a predicted lifetime and a bit error rate specification, that are distinguishable from the cited art.

Amended Claim 3 recites forming a coil with a number of loops and a radius selected according to a predicted lifetime for the optical waveguide and a bit error rate specification. Amended Claim 6 recites forming a coil with a number of loops and specifying the number to achieve an optical networking specification. Claim 7, as amended, recites meeting a bit error rate specification or a carrier to noise ratio specification. Claim 11, as amended, recites a controlled

radius operative to minimize the risk of fracture to meet a statistical lifetime prediction. Amended Claim 13 recites a number of loops selected on the basis of a return loss specification for optical communication.

Applicants respectfully submit that the cited references do not disclose, suggest, or teach the recitations of amended dependent Claims 3, 6, 7, 11, and 13 and that the disclosures and teachings of the cited references contrast with the inventions of those claims. In contrast to the claim recitations, *Liao* discloses and teaches an adjustable level of reflection for instrumentation, testing, and sensing applications. See *Liao*, page 1, lines 4-9. *Chiba* discloses obtaining a desired light attenuation quantity. See *Chiba*, Problem to be solved. Applicants further submit that neither *Sakai* nor *Akikuni* discloses or teaches a predicted lifetime, a bit error rate specification, a carrier to noise ratio specification, an optical networking specification, a statistical lifetime prediction, or a return loss specification for optical communication in accordance with the respective recitations of amended Claims 3, 6, 7, 11, and 13.

Dependent Claims 4, 5, 9, and 18 comprise recitations, such as wedging a section of optical waveguide into an impinging region, that are distinguishable from the cited art.

Amended Claim 4 recites wedging a section of the optical waveguide into the impinging region of a coiling device, while amended Claim 5, which depends from Claim 4, recites releasing the wedged section from the impinging region. Claim 18, as amended, recites releasing at least some portion of a section of optical fiber from an impinging region of a spool. The Examiner cites Figure 2B of *Liao* to support her assertion that *Liao* discloses an impinging region. Applicants respectfully submit that neither in Figure 2B nor elsewhere does *Liao* disclose an impinging region of a spool or a coiling device in accordance with amended Claims 4, 5, or 18. In contrast to an impinging region, Figure 2B of *Liao* illustrates open shafts without impinging regions. See *Liao*, Figure 2B.

As amended, Claim 9 recites a release comprising a clip that holds the coil around the radius controlling device when the optical waveguide is stowed and releases the coil in connection with providing optical communication service. Applicants respectfully submit that the cited references do not disclose, in accordance with the invention of amended Claim 9, a clip that holds a coil when an optical waveguide is stowed and releases the coil in connection with providing optical communication service. In contrast, as discussed above, *Liao* teaches a two-

shaft mechanism that transfers optical fiber between each shaft, with one end of the fiber attached to a case and the other end attached to one shaft. See *Liao* page 6, lines 2-24 and Figures 2A-2C.

Dependent Claims 12, 14 and 16 comprise recitations, such as a spare optical fiber, that are distinguishable from the cited art.

As amended, dependent Claim 12 recites a spare optical fiber, dependent Claim 14 recites an optical fiber held in reserve for expansion of an optical communication network, and dependent Claim 16 recites a pigtail optical fiber. Applicants respectfully submit that the cited references do not disclose, either individually or taken in combination, a spare optical fiber, an optical fiber held in reserve, or a pigtail optical fiber in accordance with the recitations of amended Claims 12, 14, or 16.

In view of the foregoing discussion about distinctions between the recitations of the pending dependent claims, as amended, and the cited art, Applicants submit that those dependent claims are allowable over that art and respectfully request withdrawal of the Examiner's pending rejections of all the pending dependent claims.



CONCLUSION

The foregoing is submitted as a full and complete response to the Official Action mailed May 4, 2005. Applicants thank Examiner Coonnely Cushwa for her consideration of the amendments. Applicants have shown that the pending claims are allowable and allowance of the claims is respectfully requested. It is believed that this response places the application in condition for allowance. Such action is courteously requested. If there are any issues that can be resolved with an Examiner's Amendment or a telephone conference, a telephone call to the undersigned at 404.572.3486 is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael L. Wach".

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K&S Docket: 08286.105015

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